



⑪ Publication number : **0 611 859 A2**

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## EUROPEAN PATENT APPLICATION

⑳ Application number : **94301023.1**

㉑ Int. Cl.<sup>5</sup> : **E05B 15/02, E05B 17/20, E05C 3/04**

㉒ Date of filing : **11.02.94**

㉓ Priority : **13.02.93 GB 9302918**

㉔ Date of publication of application :  
**24.08.94 Bulletin 94/34**

㉕ Designated Contracting States :  
**BE DE DK FR GB IE IT NL SE**

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㉙ **Security fitting.**

㉚ A security fitting 9 concealed in the rebate 10 between a vent frame 2 and a surrounding fixed frame 3 to resist forced entry by a tool inserted into the rebate 10 when the vent frame 2 is closed. The fitting 9 comprises respective formations 16,18 arranged to extend lengthwise of opposed side edges 5 and 13 respectively of the vent frame 2 and fixed frame 3 and to interlock when the vent frame 2 is closed to anchor the vent frame 2 and prevent the opposed side edges 5,13 being forced apart in the plane of the fixed frame 3.

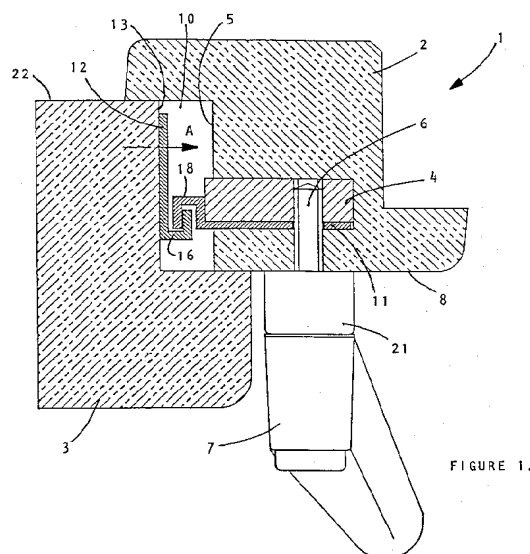


FIGURE 1.

The present invention relates to security fittings for windows, doors and the like closures.

Casement windows are susceptible to forced entry by a lever force applied to the opening vent frame by a crowbar or the like inserted into the rebate between the vent frame and the surrounding fixed frame to force apart the vent frame and fixed frame.

In an attempt to improve security, various locking mechanisms have been proposed including multi-point locking mechanisms such as espagnolettes arranged to secure the vent frame at a plurality of spaced apart positions around the periphery.

The effectiveness of such mechanisms however depends on the ability of the window, and more especially the materials used to construct the vent and fixed frames, to resist the applied forces. Thus, timber windows may be forced by splitting or breaking the timber section in which the fixings employed to secure the locking mechanism are located while plastic windows may be forced by deforming the frame section to spring open the locking mechanism.

The present invention has been made from a consideration of this problem and has for its object the provision of a security fitting of simple construction that resists forcing of the vent frame when closed.

According to one aspect of the present invention there is provided a security fitting for a window, door or the like comprising a vent frame supported for opening movement relative to a surrounding fixed frame, the fitting comprising respective coupling means arranged in use to extend lengthwise of opposed side edges of the vent frame and fixed frame and cooperating within a rebate or gap between the opposed side edges when the vent frame is closed to resist separation of the side edges in a direction substantially normal to the direction of opening movement of the vent frame.

The invented security fitting anchors the vent frame against application of a lever force applied by inserting a crowbar into the rebate between the vent frame and fixed frame whilst permitting normal opening and closing of the vent frame.

Advantageously, the coupling means have respective formations arranged in use to interlock when the vent frame is closed to prevent the side edges being forced apart in the plane of the fixed frame. For example, the formations may be generally of L or U shape providing interlocking flanges extending parallel to and spaced from the side edges.

Preferably, each coupling means is separate from the associated frame and may be secured thereto by any suitable means. For example, each coupling means may have a base flange for securing to the associated frame by screws or the like.

Alternatively, each coupling means may be formed integrally with the associated frame. For example, each coupling means may be incorporated in

an extrusion for assembly of the associated frame.

Advantageously, one of the coupling means is provided by a keeper for fastening means arranged to secure the vent frame closed. For example, the fastening means may have a bolting member movable from an inoperative position to an operative position for engagement with the keeper to secure the vent frame closed.

In a preferred arrangement, the bolting member comprises a curved plate mounted for rotation about an axis extending generally parallel to the rebate such that a leading edge of the plate is engageable with the keeper to urge the vent frame towards the closed position.

Preferably, the other coupling means provides a support for the underside of the curved plate when engaged with the keeper. In this way, the engagement between the plate and the keeper is reinforced to resist separation thereof.

Advantageously, the keeper has a cut-out providing clearance for the other coupling means for opening and closing the vent frame, and the curved plate is engageable with the keeper on either side of the cut-out.

According to another aspect of the invention there is provided a window, door or like closure comprising a vent frame supported for opening movement relative to a surrounding fixed frame with opposed side edges of the vent frame and fixed frame defining a rebate when the vent frame is closed, and a security fitting comprising respective coupling means extending lengthwise of each side edge and arranged to interlock within the rebate when the vent frame is closed to prevent the opposed side edges being forced apart in the plane of the fixed frame.

The invention will now be described in more detail by way of example only with reference to the accompanying drawing wherein:-

FIGURE 1 is a sectional view of part of a casement window incorporating a first embodiment of the invented security fitting;

FIGURE 2 is a perspective view of the component parts of the security fitting shown in Figure 1;

FIGURE 3 is a sectional view of part of a casement window incorporating a second embodiment of the invented security fitting;

FIGURE 4 is an exploded isometric view of the lock shown in Figure 3; and

FIGURE 5 is a perspective view of one of the component parts of the security fitting shown in Figure 3.

Referring first to Figure 1, a timber casement window 1 is shown comprising an outward opening vent frame 2 mounted by hinges (not shown) in a surrounding fixed frame 3 for pivotal movement about a vertical or horizontal axis.

A lock case 4 is mortised in the side edge 5 of the

vent frame 2 and is coupled by a spindle 6 to a lever handle 7 mounted on the inner face 8 of the vent frame 2. The lever handle 7 is rotatable for actuation of a fastening mechanism (not shown) to secure the vent frame 2 closed.

The fastening mechanism may be of any suitable type providing either single or multi-point locking as will be familiar to those skilled in the art. For example the lock case 4 may house the gearing for an espagnolette or cremone multi-point lock.

To provide improved security against forced entry when the window 1 is closed by a crowbar or similar tool inserted into the rebate 9 between the vent frame 2 and fixed frame 3 at the location of the lock case 4, a security fitting 10 is provided comprising two coupling members 11,12 respectively mounted on opposed side edges 5,13 of the vent frame 2 and fixed frame 3.

One of the coupling members 12 has a base flange 14 with three holes 15 by means of which it is secured to the side edge 13 of the fixed frame 3 by screws (not shown) and an L-shaped formation 16 extending along one side edge defining a channel-section recess open to the outside of the window 1.

The other coupling member 11 has a base flange 17 that seats against the side of the lock case 4 in the mortise and a U-shaped formation 18 extending along one side edge that locates against the lock case 4 and defines a channel-section recess open to the inside of the window 1.

The base flange 17 has a central clearance hole 19 for the spindle 6 and smaller clearance holes 20 on either side by means of which it is retained by screws (not shown) connecting base plate 21 of the handle 7 to the lock case 4.

As shown in Figure 1, the formations 16,18 provide flanges extending parallel to and spaced from the side edges 5,13 which co-operate within the rebate 10 when the vent frame 2 is closed to resist separation of the opposed side edges 5,13 in a direction normal to the direction of opening movement as indicated by arrow A. In this way, forced entry from the outside by means of a crowbar or similar tool inserted into the rebate 10 to force apart the vent frame 2 and the outer frame 3 is resisted by the interlocking formations 16,18.

As will be appreciated, the security fitting 9 does not interfere with normal opening and closing of the vent frame 2 and is concealed in the rebate 10 between the vent frame 2 and outer frame 3 when the window 1 is closed so as not to detract from the aesthetic appearance of the window 1.

The coupling members 11,12 are made of metal or alloy such as aluminium and may conveniently be cut to length from extrusions of the appropriate cross-section. Alternatively, the coupling members 11,12 may be castings.

In a modification (not shown), the base flange 14

of the coupling member 10 mounted on the fixed frame 3 may be formed to extend over the outer front face 22 of the fixed frame thereby strengthening the outer frame 3 against any attempt to force the window 1 from the outside. The front face 22 may be rebated so that the flange 14 is substantially flush with the outer surface so as not to interfere with the vent frame 2.

Referring now to Figures 3 to 5, a second embodiment of the invented security fitting is shown with like reference numerals in the series 100 being used to indicate parts corresponding to the first embodiment.

In this second embodiment, the security fitting 109 comprises coupling member 111 having a U-shaped formation 118 that co-operates within the rebate 110 with an L-shaped formation 116 of a keeper 130 incorporating coupling member 112 when the vent frame 102 is closed to resist forced entry from the outside by means of a crowbar or similar tool inserted into the rebate 110 to force apart the vent frame 102 and the outer frame 103 as above-described.

The keeper 130 has a base flange 114 for securing to the side edge 113 of the fixed frame 103 by screws or the like (not shown) and, spaced outwardly of the formation 116 in the direction of opening movement, a longitudinal rib 131 at the outer edge for engagement by a leading edge 132 of a bolting member 133 of a fastening mechanism to secure the vent frame 102 closed.

The bolting member 133 comprises a curved plate located between opposed complementary concave and convex internal guide faces 134 and 135 respectively of lock case 104 mortised in the side edge 105 of the vent frame 102 opposite the keeper 130.

The plate 133 has a central cut-out 136 in which an actuator bush 137 mounted on spindle 106 is received for rotation by operating handle 107. The bush 137 has a cam formation 138 engageable with the cut-out 136 on rotation of the bush 137 in one direction to move the plate 133 from an inoperative position to an operative position for engagement of leading edge 132 with the keeper rib 131, and to return the plate 133 to the inoperative position on rotation of the bush 137 in the opposite direction.

During movement between the inoperative and operative positions, the plate 133 is simultaneously guided for rotation about an axis parallel to the rebate 110 by the guide faces 134,135. As a result, the leading edge 132 is displaced towards the outside of the window 1 as the plate 133 moves towards the operative position to engage the rib 131 and urges the vent frame 102 inwards to compress seal member 139.

The coupling member 111 has a pair of upturned lugs 140 on the side edge remote from formation 118 to locate the member 111 on the lock case 104 for assembly purposes.

The formation 118 is centrally located between opposite ends of the lock case 104 and is aligned with a cut-out (not shown) in the rib 131 of keeper 130 for passage of the formation 118 to enable the vent frame 102 to be opened and closed with the plate 133 in the inoperative position.

The plate 133 is engageable with the rib 131 on either side of the cut-out and part of the coupling member 111 provides a curved support surface 141 for the underside of the projecting centre part of the plate 133 in the operative position to assist in maintaining engagement of the plate 133 with the rib 131 thereby further improving security against forced entry.

It will be appreciated that the invented security fitting has application to frames made of timber, plastics, metals, alloys or any combination thereof and that the strong interlock provided when the vent frame is closed increases the resistance to forced entry by breaking or deforming the frame sections so as to release the locking mechanism.

The resistance to forced entry may be increased further, especially for larger sizes of vent frame, by providing several security fittings at spaced apart positions within the rebate on one or more sides of the vent frame and, where multi-point locks are employed, each locking point may be provided with a security fitting to resist release thereof.

In the case of frames constructed from extrusions of plastics, metal or alloy the coupling members may be separate for securing to the frames as above-described or one or both coupling members may be incorporated in the extrusions so as to be an integral part of the vent frame and/or outer frame.

Finally, it will be understood that application of the invented security fitting is not restricted to windows as above-described in the exemplary embodiments but has application to any closure mounted for opening movement relative to a surrounding fixed frame and the term "vent frame" used in the description and claims is to be construed accordingly as including doors and like closures.

## Claims

1. A security fitting for a window, door or the like comprising a vent frame (2;102) supported for opening movement relative to a surrounding fixed frame (3;103) characterised in that the fitting (9;109) comprises respective coupling means (11,12;111,112) arranged in use to extend lengthwise of opposed side edges (5,13;105;113) of the vent frame (2;102) and fixed frame (3;103) and co-operating within a rebate or gap (10;110) between the opposed side edges (5,13;105,113) when the vent frame (2;102) is closed to resist separation of the side edges (5,13;105,113) in a

direction substantially normal to the direction of opening movement of the vent frame (2;102).

2. A security fitting according to Claim 1 characterised in that the coupling means (11,12;111,112) comprise respective formations (16,18;116,118) of L or U shape arranged in use to interlock when the vent frame (2;102) is closed to prevent the side edges (5,13;105,113) being forced apart in the plane of the fixed frame (3;103).
3. A security fitting according to Claim 2 characterised in that each coupling means (11,12;111,112) is adapted for securing to the associated frame (2,3;102,103).
4. A security fitting according to Claim 2 characterised in that one or both coupling means is formed integrally with the associated frame.
5. A security fitting according to any one of the preceding Claims characterised in that the coupling means (11,12;111,112) are associated with fastening means (4;104) for securing the vent frame (2;102) closed.
6. A security fitting according to Claim 5 characterised in that one of the coupling means (112) is provided by a keeper (130) for the fastening means (104).
7. A security fitting according to Claim 6 characterised in that the fastening means (104) has a bolting member (133) movable from an inoperative position to an operative position for engagement with the keeper (130) to secure the vent frame (102) closed.
8. A security fitting according to Claim 7 characterised in that the bolting member (133) comprises a curved plate (133) mounted for rotation about an axis extending generally parallel to the rebate (110) such that a leading edge (132) of the plate (133) is engageable with the keeper (130) to urge the vent frame (102) towards the closed position.
9. A security fitting according to Claim 8 characterised in that the other coupling means (111) provides a support (141) for underside of the curved plate (133) when engaged with the keeper (130).
10. A security fitting according to Claim 9 characterised in that the keeper (130) has a cut-out providing clearance for the other coupling member (111) for opening and closing the vent frame (102), and the plate (133) is engageable with the keeper (130) on either side of the cut-out.

11. A security fitting in or for a window, door or the like, the security fitting (9;109) comprising first and second coupling members (11,12;111,112) for a vent frame (2;102) and a surrounding fixed frame (3;103) respectively, each coupling member (11,12;111,112) having a formation (16,18;116,118) arranged to extend lengthwise of a rebate (10;110) between the vent frame (2;102) and fixed frame (3;103), and the formations (16,18;116,118) co-operating when the vent frame (2;102) is closed to locate the vent frame (2;102) relative to the fixed frame (3;103) in a direction substantially normal to the direction of opening movement.
12. A window, door or like closure comprising a vent frame (2;102) supported for opening movement relative to a surrounding fixed frame (3;103) with opposed side edges (5,13;105,113) of the vent frame (2;102) and fixed frame (3;103) defining a rebate or gap (10;110) when the vent frame (2;102) is closed characterised in that a security fitting (9;109) is provided comprising respective coupling means (11,12;111,112) extending lengthwise of each side edge (5,13;105,113) and arranged to interlock within the rebate or gap (10;110) when the vent frame (2;102) is closed to prevent the opposed side edges (5,13;105,113) being forced apart in the plane of the fixed frame.
13. A window, door or like closure according to Claim 12 characterised in that a plurality of security fittings (9;109) are provided spaced apart around the periphery of the vent frame (2;102).

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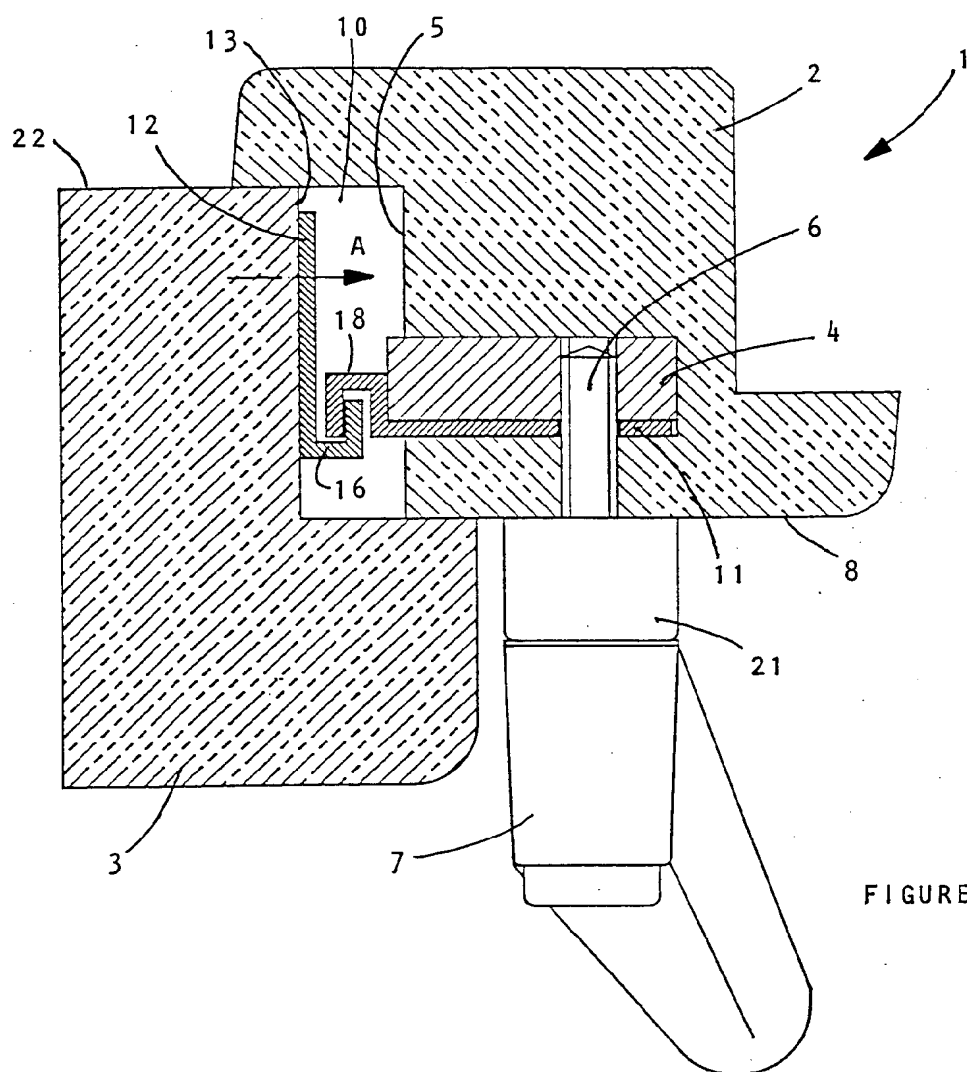


FIGURE 1.

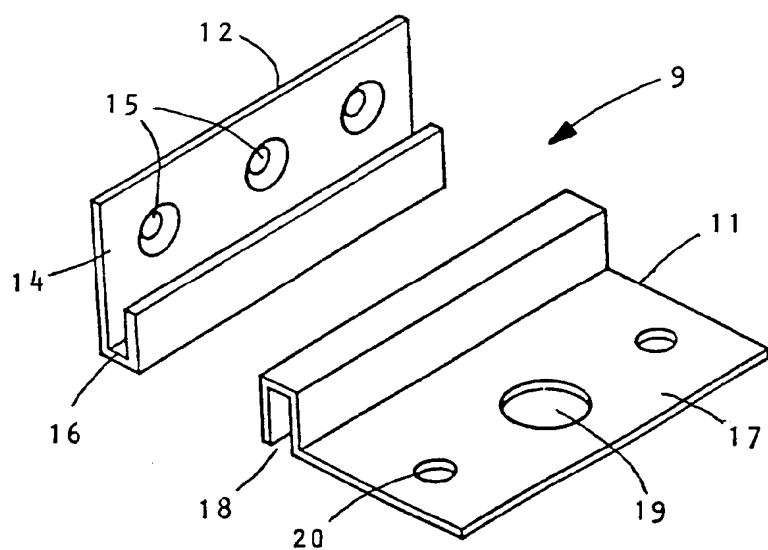


FIGURE 2.

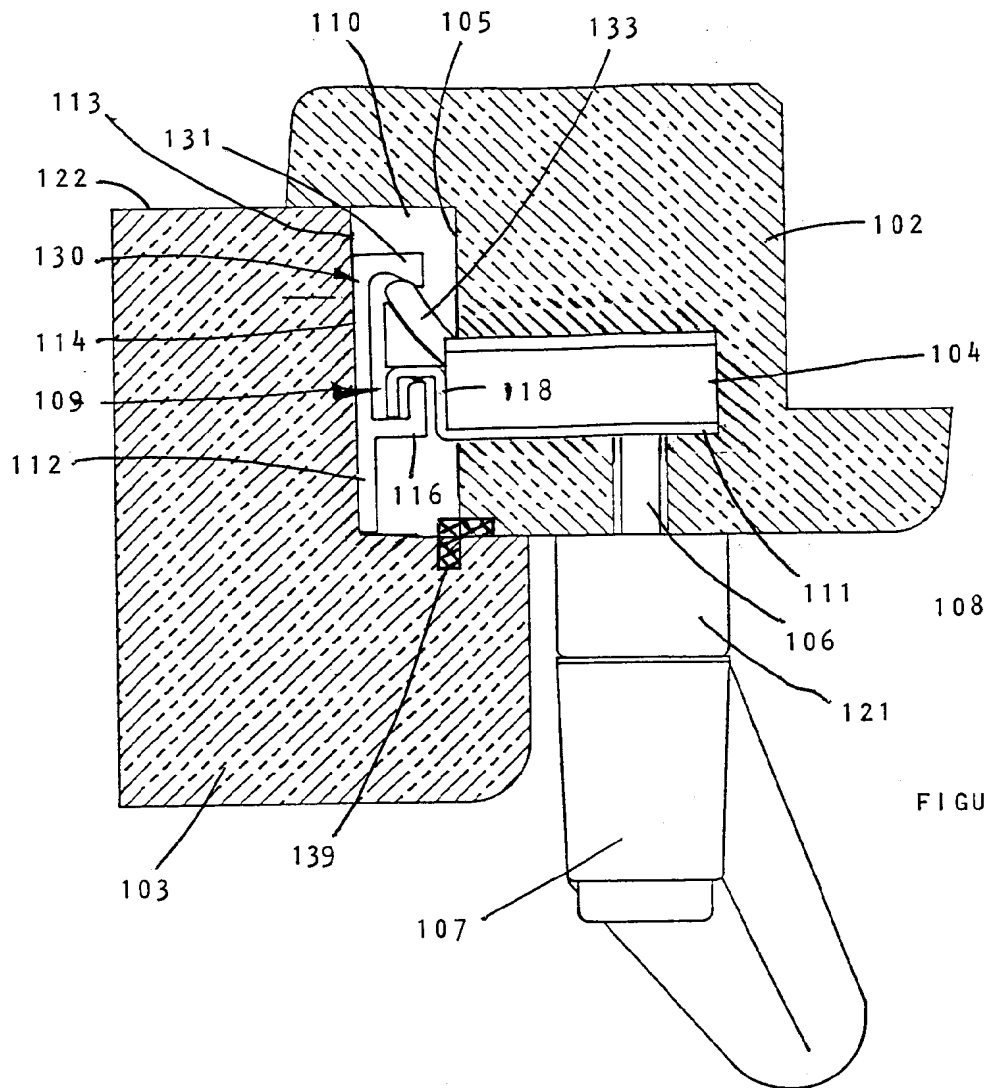


FIGURE 3.

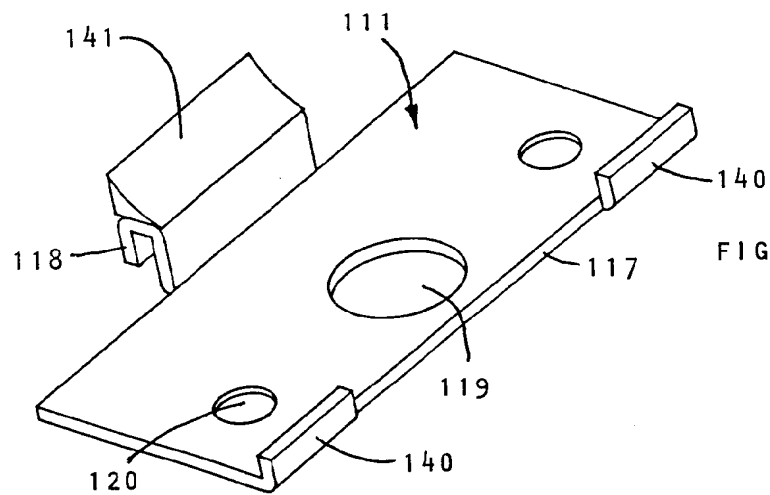


FIGURE 5.

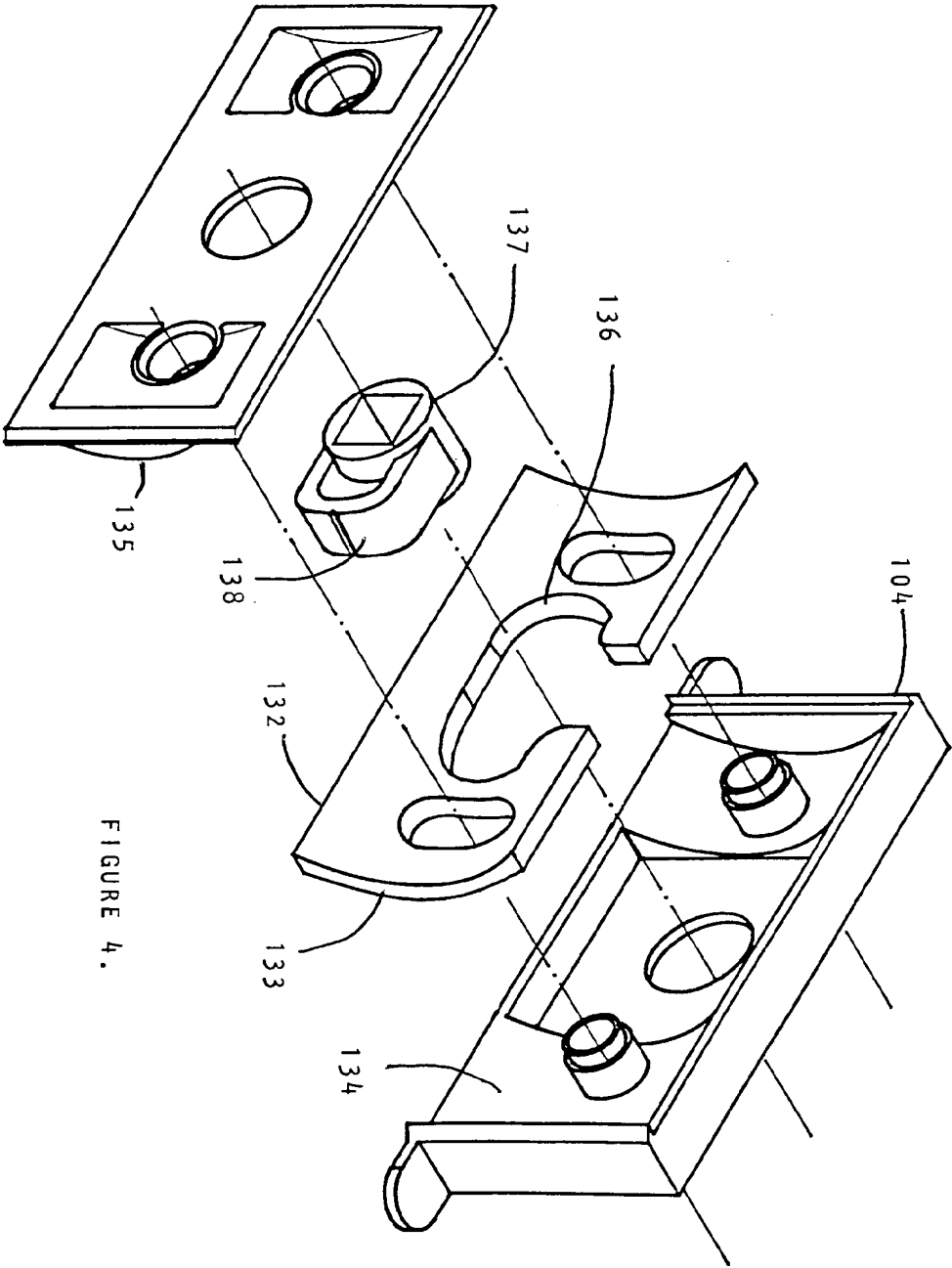


FIGURE 4.